

Notice of Allowability

Application No.

10/679,662

Examiner

Hashem Farrokh

Applicant(s)

HAASE ET AL.

Art Unit

2187

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8/28/06.
2. ☒ The allowed claim(s) is/are 1-24.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1. ☐ Notice of References Cited (PTO-892) | 5. ☐ Notice of Informal Patent Application |
| 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. ☒ Examiner's Amendment/Comment |
| 4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. ☒ Examiner's Statement of Reasons for Allowance |
| | 9. ☐ Other _____ |

EXAMINER'S AMENMENT

The Examiner initiated a telephone call to inform the Applicant, Mr. Carl A. Giordano (Reg. # 41,780) to inform that the inclusion of expression "as soon as possible" in the newly amended independent claims 1, 10, 19, and 24 has made these claims indefinite and they can be rejected under 35 USC § 112, 2nd paragraph. The Applicant agreed and indicated that he would amend the claims to overcome the 35 USC § 112 rejections. The Applicant amended the claims and on 9/25/06 emailed a copy of the attached amended claims to the Examiner and authorized the Examiner to make an examiner amendment. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee

Please make the following amendment:

Claim 1:

Line 7, after "source" insert --in a copy-on-demand process:--

Line 12, replace "as soon as possible" with --as soon as the required extents have been copied from the clone to the source--

Claim 10:

Line 10, after "source" insert --in a copy-on-demand process:--

Line 15, replace "as soon as possible" with --as soon as the required extents have been copied from the clone to the source--

Claim 19:

Line 12, after "source" insert --in a copy-on-demand process:--

Line 17, replace "as soon as possible" with --as soon as the required extents have been copied from the clone to the source--

Claim 24:

Line 10, after "source" insert --in a copy-on-demand process:--

Line 15, replace "as soon as possible" with --as soon as the required extents have been copied from the clone to the source--

REASONS FOR ALLOWANCE

The following are the Examiner's statements of reasons for allowance:

The prior art does not teach or suggest the combination and relationship between these features:

1. *The primary reasons for allowance of independent claims 1-24 in the instant application is the combination with the inclusion of the following limitations: **restoring the source by copying data content from the clone to overwrite the data content of the source in a copy-on-demand process; executing restoration of the affected source extents in a manner to allow the host write request to be processed as soon as the required extents have been copied from the clone to the source.***

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Conclusion

Any inquiry concerning this communication should be directed to Hashem Farrokh whose telephone number is (571) 272-4193. The examiner can normally be reached Monday-Friday from 8:00 AM to 5:00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A Sparks, can be reached on (571) 272-4201.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBS) at 866-217-9197 (toll-free).

HF

HF

2006-09-26

Brian R. Peugh
Primary Examiner

9/27/06

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

<i>APPLICANT:</i>	David Haase, et al	<i>GROUP ART UNIT:</i>	2187
<i>U.S.S.N.:</i>	10/679,662	<i>CONFIRMATION NO.:</i>	4111
<i>FILING DATE:</i>	October 6, 2003	<i>EXAMINER:</i>	Farrokh, Hashem
		<i>CUSTOMER NO.</i>	24227
<i>TITLE:</i>	SYSTEM AND METHOD FOR MANAGING DATA ASSOCIATED WITH COPYING AND RECOVERY PROCEDURES IN A DATA STORAGE ENVIRONMENT		

E-mail " Hashem.Farrokh@USPTO.gov"

RESPONSE TO TELEPHONE INTERVIEW

Sir:

This is in response to the Telephone Interview of September 19, 2006 initiated by the Examiner, applicant proposes the following amendments be made to the claims:

Applicant: David Haase, *et al.*
U.S.S.N.: 10/679,662
Filing Date: October 6, 2003
EMC Docket No.: EMC-03-100CIP1

Please amend the subject application, as follows:

Amendments to the claims begin on page 3;

Remarks begin on page 9 of this paper.

Proposed Amendments ---Draft

In the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the Application.

Listing of Claims:

1. (Currently amended) In a data storage environment having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system, a method of managing data content during a restoration of the source, the method comprising the steps of:
 - restoring the source by copying data content from the clone to overwrite the data content of the source in a Copy-on-Demand process;
 - receiving a host write request during the restoring step;
 - determining extents on the source that would be affected by the host write request if carried out;
 - executing restoration of the affected source extents in a manner to allow the host write request to be processed [as soon as possible] as soon as the required extents have been copied from the clone to the source; and
 - setting an indicator to indicate that the affected extents need to be re-copied.
2. (Original) The method of claim 1, wherein the source and the clone are each represented by respective first and second logical units.

3. (Previously presented) The method of claim 1, wherein a map denominated as a clone delta map is used to track extents of the clone that are different from those of the source.
4. (Original) The method of claim 3, wherein the indicator is set in memory.
5. (Original) The method of claim 3, wherein the clone delta map is used to copy only extents that are different between the clone and its source during the restoration step.
6. (Original) The method of claim 4, wherein the clone delta map is used to copy only extents that are different between the clone and its source during the restoration step.
7. (Previously presented) The method of claim 2, wherein a map denominated as a clone delta map is used to track extents of the clone that are different from those of source.
8. (Original) The method of claim 7, wherein the indicator is set in memory.
9. (Original) The method of claim 8, wherein the clone delta map is used to copy only extents that are different between the clone and its source during the restoration step.
10. (Currently amended) A system for managing data content during restoration of data from a second volume of data to a first volume of data, the system comprising:

a data storage system having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system;

computer-executable program logic configured for causing the following computer-executed steps to occur;

restoring the source by copying data content from the clone to overwrite the data content of the source in a Copy-on-Demand process;

receiving a host write request during the restoring step;

determining extents on the source that would be affected by the host write request if carried out;

executing restoration of the affected source extents in a manner to allow the host write request to be processed [[as soon as possible]] as soon as the required extents have been copied from the clone to the source; and

setting an indicator to indicate that the affected extents need to be re-copied.

11. (Original) The system of claim 10, wherein the source and the clone are each represented by respective first and second logical units.

12. (Previously presented) The system of claim 10, wherein a map denominated as a clone delta map is used to track extents of the clone that are different from those of the source.

13. (Original) The system of claim 12, wherein the indicator is set in memory.
14. (Original) The system of claim 12, wherein the clone delta map is used to copy only extents that are different between the clone and its source during the restoration step.
15. (Original) The system of claim 13, wherein the clone delta map is used to copy only extents that are different between the clone and its source during the restoration step.
16. (Previously presented) The system of claim 11, wherein a map denominated as a clone delta map is used to track extents of the clone that are different from those of the source.
17. (Original) The system of claim 16, wherein the indicator is set in memory.
18. (Original) The system of claim 17, wherein the clone delta map is used to copy only extents that are different between the clone and its source during the restoration step.
19. (Currently amended) A program product for use in a data storage environment and being for managing data content during restoration of data from a second volume of data to a first volume of data, wherein the data storage environment includes:

a data storage system having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated as the clone and

which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system; and

the program product includes computer-executable logic contained on a computer-readable medium and which is configured for causing the following computer-executed steps to occur:

restoring the source by copying data content from the clone to overwrite the data content of the source in a Copy-on-Demand process;

receiving a host write request during the restoring step;

determining extents on the source that would be affected by the host write request if carried out;

executing restoration of the affected source extents in a manner to allow the host write request to be processed [[as soon as possible]] as soon as the required extents have been copied from the clone to the source; and

setting an indicator to indicate that the affected extents need to be re-copied.

20. (Original) The program product of claim 19, wherein the source and the clone are each represented by respective first and second logical units.

21. (Previously presented) The program product of claim 19, wherein a map denominated as a clone delta map is used to track extents of the clone that are different from those of the source.

22. (Original) The program product of claim 21, wherein the indicator is set in memory.

23. (Original) The program product of claim 22, wherein the clone delta map is used to copy only extents that are different between the clone and its source during the restoration step.

24. (Currently amended) An apparatus for use in a data storage environment and being for managing data content during restoration of data from a second volume of data to a first volume of data, wherein the data storage environment includes:

a data storage system having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system; and;

the apparatus including:

means for restoring the source by copying data content from the clone to overwrite the data content of the source in a Copy-on-Demand process;

means for receiving a host write request during the restoring step;

means for determining extents on the source that would be affected by the host write request if carried out;

executing restoration of the affected source extents in a manner to allow the host write request to be processed [[as soon as possible]] as soon as the required extents have been copied from the clone to the source; and

setting an indicator to indicate that the affected extents need to be re-copied.

REMARKS

Reconsideration is respectfully requested in view of the amendments made to the claims and for the remarks made herein.

Claims 1-24 are pending and stand rejected.

Claims 1, 10, 19 and 24 have been amended.

In response to the telephonic interview between the Examiner and applicant's attorney, applicant submits proposed amendments to the claims in view of the Examiner's statements. The independent claims have been amended to replace the claim language "as soon as possible." which the Examiner indicated to be allowable with "as soon as the required extents have been copied from the clone to the source." No new matter has added. Support for the amendment may be found at least on page 21, lines 4-10. In addition, the restoration step has been amended to more clearly recite that the restoration is performed "in a Copy-on-Demand process." No new matter has been added support for the amendment may be found at least on page 9, which defines a copy on demand process as "*Copy On Demand (COP)*: Process of copying a specific extent from the Clone to the Source, as occasionally required during a Protected Restore."

Entry of the proposed amendments to the claims is respectfully requested.

In the event the Examiner deems personal contact desirable in the disposition of this case, the Examiner is invited to call the undersigned attorney at 914 798 8505.

Please charge all fees occasioned by this submission to Deposit Account No. 05-0889, as indicated on the Transmittal form, filed in duplicate, herewith.

Respectfully submitted,

Dated: September 25, 2006 _

//s//

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Applicant: David Haase, *et al.*
U.S.S.N.: 10/679,662
Filing Date: October 6, 2003
EMC Docket No.: EMC-03-100CIP1

Please direct all communications to:

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176 South Street
Hopkinton, MA 01748

Proposed Amendments ---Draft